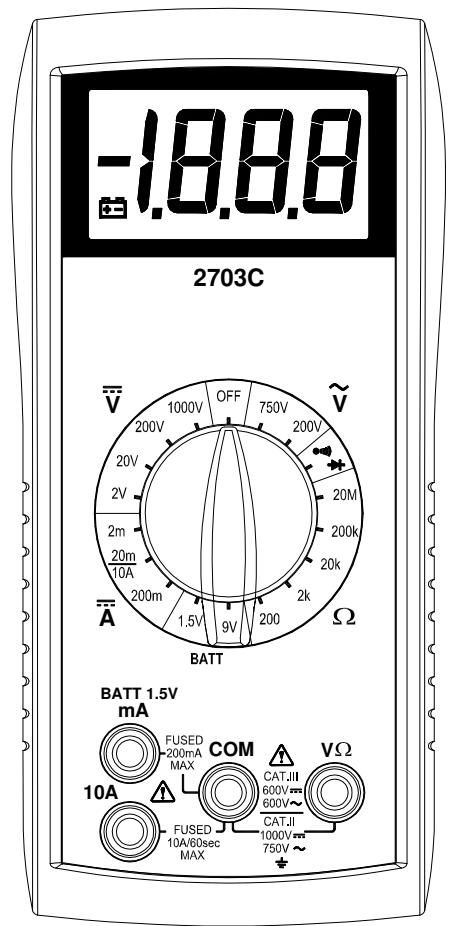


OPERATING INSTRUCTIONS
MODEL 2703C
DIGITAL MULTIMETER



SAFETY INFORMATION

The following safety information must be observed to ensure maximum personal safety during the operation at this meter:

Use the meter only as specified in this manual or the protection provided by the meter might be impaired.

Test the meter on a known voltage before using it to determine if hazardous voltage is present.

Do not use the meter if the meter or test leads look damaged, or if you suspect that the meter is not operating properly.

Never ground yourself when taking electrical measurements. Do not touch exposed metal pipes, outlets, fixtures, etc., which might be at ground potential. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats, or any approved insulating material.

Turn off power to the circuit under test before cutting, unsoldering, or breaking the circuit. Small amounts of current can be dangerous.

Use caution when working above 60V dc or 30V ac rms. Such voltages pose a shock hazard.

When using the probes, keep your fingers behind the finger guards on the probes.

Measuring voltage which exceeds the limits of the multimeter may damage the meter and expose the operator to a shock hazard. Always recognize the meter voltage limits as stated on the front of the meter.

SPECIFICATIONS

Display: 3½ digit liquid crystal display (LCD) with a maximum reading of 1999.
Polarity: Automatic, positive implied, negative polarity indication.
Overrange: (OL) or (-OL) is displayed.
Zero: Automatic.
Low battery indication: The "⎓" is displayed when the battery voltage drops below the operating level.

Measurement rate: 2.5 times per second, nominal.
Auto power off: Approx. 25 minutes.

Operating environment: 0°C to 50°C at < 70% relative humidity.

Storage temperature: -20°C to 60°C, 0 to 80% relative humidity.

Accuracy: Stated accuracy at 23°C ±5°C, < 75% relative humidity.

Temperature Coefficient: 0.1 x (specified accuracy) per °C. (°C to 18°C, 28°C to 50°C).

Altitude: 6561.7 feet (2000m).
Power: Single standard 9-volt battery, NEDA 1604, JIS 006P, IEC 6F22.
Battery life: 200 hours typical with carbon-zinc.
Dimensions: 165mm (H) x 78mm (W) x 42.5mm (D).
Weight: Approx. 10.0 oz.(285g) including holster.
Accessories: One set test leads, one spare fuse, 9V battery (installed), and Operating Instructions.

DC VOLTS

Ranges: 2V, 20V, 200V, 1000V
Resolution: 1mV
Accuracy: ± (1.2% rdg + 1 dgt)
Input impedance: 10MΩ
Overload protection: 1000VDC or 750VAC rms

AC VOLTS (50Hz - 500Hz)

Ranges: 200V, 750V
Resolution: 0.1V
Accuracy: ± (2.0% rdg + 5 dgts) on 200V range
± (2.0% rdg + 10 dgts) on 750V range
Input impedance: 10MΩ
Overload protection: 1000VDC or 750VAC rms

DC CURRENT

Ranges: 2mA, 20mA, 200mA, 10A
Resolution: 1uA
Accuracy: ± (1.5% rdg + 1 dgts) on 2mA to 200mA ranges
± (3.0% rdg + 3 dgts) on 10A range
Input protection: 0.5A/500V fast blow ceramic fuse on mA input
10A/600V fast blow ceramic fuse on 10A input
10A Input: 10A for 60 seconds maximum followed by a 10 minute cooling period

RESISTANCE

Ranges: 200Ω, 2k, 20k, 200k, 20MΩ
Resolution: 0.1Ω
Accuracy: ± (1.5% rdg + 4 dgts) on 2kΩ to 200kΩ ranges
± (3.0% rdg + 5 dgts) on 20MΩ range
Open circuit volts: 0.3Vdc typical, (3.0Vdc on 200Ω range)
Overload protection: 500VDC or AC rms

CONTINUITY

Audible indication: Less than 100Ω
Response time: 100ms
Overload protection: 500VDC or AC rms

DIODE TEST

Test current: Approx. 1.0mA
Accuracy: ±(3.0% rdg + 3dgts)
Open circuit volts: 3.0Vdc typical
Overload protection: 500VDC or AC rms

BATTERY TEST

Ranges: 1.5V, 9V
Resolution: 1mV, 10mV
Accuracy: ±(3.5% rdg + 2 dgts)
Loaded current: 150mA typical for 1.5V range, 5mA typical for 9V range
Overload protection: 500V DC or AC rms on 9V range, 0.5A/500V fast blow ceramic fuse on 1.5V range.

OPERATION

Before taking any measurements, read the Safety Information Section. Always examine the instrument for damage, contamination (excessive dirt, grease, etc.) and defects. Examine the test leads for cracked or frayed insulation. If any abnormal conditions exist do not attempt to make any measurements.

Voltage Measurements

- 1.Connect the red test lead to "VΩ" jack and the black test lead to the "COM" jack.
- 2.Set the Function/Range switch to the desired voltage type (AC or DC) and range. If magnitude of voltage is not known, set switch to the highest range and reduce until a satisfactory reading is obtained.
- 3.Connect the test leads to the device or circuit being measured.
4. For dc, a (-) sign is displayed for negative polarity; positive polarity is implied.

Current Measurements

- 1.Connect the red test lead to the (uA, mA or 10A) jack and the black test lead to the "COM" jack.
- 2.Set the Function/Range switch to the DC or AC ranges.
- 3.Remove power from the circuit under test and open the normal circuit path where the measurement is to be taken. Connect the meter in series with the circuit.
- 4.Apply power and read the value from the display.

Resistance and Continuity Measurements

- 1.Set the Function/Range switch to the desired resistance range or continuity position.
- 2.Remove power from the equipment under test.
- 3.Connect the red test lead to the "VΩ" jack and the black test lead to the "COM" jack.
- 4.Touch the probes to the test points. In ohms, the value indicated in the display is the measured value of resistance. In continuity test, the beeper sounds continuously, if the resistance is less than 100Ω.

Diode Tests

- 1.Connect the red test lead to the "VΩ" jack and the black test lead to the "COM" jack.
- 2.Set the Function/Range switch to the "→|←" position.
- 3.Turn off power to the circuit under test. External voltage across the components causes invalid readings.
- 4.Touch probes to the diode. A forward-voltage drop is about 0.6V (typical for a silicon diode).
- 5.Reverse probes. If the diode is good, "OL" is displayed. If the diode is shorted, "000" or another number is displayed.
6. If the diode is open, "OL" is displayed in both directions.

Battery Test

1. Connect the red test lead to the (mA/BATT 1.5V) jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the desired 1.5V battery test range.
3. Connect the test leads to the 1.5Vdc battery under test. Normally, a good 1.5Vdc battery will read above 1.25Vdc. Consult the battery manufacturer for complete battery specifications to determine actual battery life remaining and condition of battery.

MAINTENANCE

WARNING

Remove test leads before changing battery or fuse or performing any servicing.

Battery Replacement

Power is supplied by a 9 volt battery. (NEDA 1604, IEC 6F22). The "⎓" appears on the LCD display when replacement is needed. To replace the battery, remove the three screws from the back of the meter and lift off the front case. Remove the battery from case bottom.

Fuse Replacement

If no current measurements are possible. Check for a blown overload protection fuse. For access to fuses, remove the three screws from the back of the meter and lift off the front case. Replace F1 only with the original type 0.5A/500V, fast acting ceramic fuse, 6.35x32mm. Replace F2 only with the original type 10A/600V, fast acting ceramic fuse, 6.35x25.4mm.

Cleaning

Wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents. Dirt or moisture in the terminals can affect readings.



Safety: Conforms to IEC61010-1 (EN61010-1), CATII 1000V, CATIII 600V, Class II, Pollution degree 2 Indoor use.

CATII: Is for measurements performed on circuits directly connected to the low-voltage installation.

CAT III: Is for measurements performed in the building installation.

EMC: Conforms to EN61326.

The symbols used on this instrument are:

- ⚠ Caution, refer to accompanying documents
- 🔲 Equipment protected throughout by Double insulation (Class II)
- ~ Alternating current
- Direct current
- ⏚ Ground